



Goyal 7-16-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): V.K. Goyal et al.
Case: 7-16-1
Serial No.: 09/698,437
Filing Date: October 27, 2000
Group: 2654
Examiner: Vincent P. Harper

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Signature: *Lena M. Harkin* Date: June 23, 2003

Title: Methods and Apparatus for Wireless Transmission
Using Multiple Description Coding

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REPLY BRIEF

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Sir:

This Reply Brief is submitted in response to the Examiner's Answer dated April 22, 2003 in the above-referenced application.

ARGUMENT

The Examiner in his Answer to the Appeal Brief filed by Applicants on February 27, 2003, reasserts the argument that each of claims 1-7, 10-18, 21 and 22 is unpatentable under 35 U.S.C. §103(a). Applicants respectfully disagree with the assertions presented by the Examiner in the Answer, for the reasons identified below, as well as for the reasons previously set forth in the Appeal Brief.

Independent claims 1 and 12 stand rejected under §103(a) as being unpatentable over an article by Fleming et al. entitled "Generalized Multiple Descriptive Vector Quantization," (hereinafter "Fleming") in view of U.S. Patent No. 5,048,057 (hereinafter "Saleh"). Each of these claims includes limitations identified in the Appeal Brief as limitations (i) and (ii). Limitation (i)

specifies that different descriptions of a given portion of a signal are arranged into packets such that at least a first description of the given portion is placed in a first packet and a second description of the given portion is placed in a second packet. Limitation (ii) specifies that the packets are transmitted using a frequency hopping modulator, wherein a hopping rate of the modulator is configured based at least in part on a number of descriptions generated for each of a plurality of different portions of the signal.

The Examiner in formulating the §103(a) rejection of independent claims 1 and 12 argues that the claimed invention is obvious in view of a proposed combination of Fleming and Saleh. However, as Applicants indicated in their Appeal Brief, Fleming teaches conventional multiple description coding with no reference to frequency hopping modulators. Saleh teaches frequency hopping modulation with no reference to multiple description coding. Applicants therefore assert that the Examiner has failed to identify any objective evidence of record to support the proposed combination, or the modification of the reference teachings to meet limitations (i) and (ii) of claims 1 and 12.

The Examiner in the Answer, at page 5, second and last paragraphs, acknowledges that Fleming fails to provide any teaching or suggestion regarding the frequency hopping aspects of limitations (i) and (ii). As motivation for the proposed combination of Saleh with Fleming, the Examiner relies on the following statements in column 1, lines 26-33 and 54-57, which provide as follows, with emphasis supplied:

Various techniques have been proposed to counter the fading and interference problems. For example, antenna diversity has been proposed to counteract fading. In addition, to counter both fading and interference, the use of direct sequence spread spectrum transmission or frequency hopping - possibly combined with some form of conventional channel coding - has been proposed. . . . Advantageously, channel coding may be used in conjunction with the frequency hopping in such a way that the lost information can be recovered with high probability.

Applicants submit that these statements from Saleh fail to provide the requisite motivation at least in part because they are not specific as to the type of coding which may be used. What is claimed in independent claims 1 and 12 is a particular combination of multiple description coding with frequency hopping, as set forth in limitations (i) and (ii) above. A reference that simply notes that channel coding in general can be used in conjunction with frequency hopping does not render obvious the particular limitations (i) and (ii) of the claimed arrangements. This is because one skilled in the art would not be motivated from the Saleh teachings to utilize multiple description coding in particular, rather than some other type of channel coding such as convolutional coding, block coding, or other single description coding, and to modify such coding in the manner recited in limitations (i) and (ii).

Secondary evidence of non-obviousness can be seen in the failure of others to recognize, despite a long period of exposure to the relied-upon teachings, the combination which is alleged to be obvious by the Examiner. The Saleh teachings have been available to the public for more than a decade, since September 10, 1991. Similarly, multiple description coding has been well-known for at least a decade, as indicated by the 1993 Vaishampayan article cited by Applicants as part of their Information Disclosure Statement. One cannot help but wonder why skilled artisans in this field, despite the long exposure to the relevant teachings, have not heretofore made the connection between multiple description coding and frequency hopping that is alleged to be obvious by the Examiner. Applicants alone have discovered this connection, along with its concomitant benefits as outlined in the specification at page 3, lines 1-4, and are therefore entitled to claims commensurate with the scope of their discovery.

Applicants further submit that the position advanced by the Examiner in formulating the §103(a) rejection of claims 1 and 12 is a classic case of hindsight-based reasoning. Where in the objective evidence of record is the motivation to combine Fleming and Saleh, or to modify their collective teachings to reach limitations (i) and (ii) of claims 1 and 12? What appears to have occurred is that the Examiner, after a review of the present application, performed a keyword search on multiple description coding and came up with the Fleming reference, and performed another keyword search on frequency hopping and came up with the Saleh reference. The problem is that the knowledge of the relationship between multiple description coding and frequency hopping, used

to derive the above-noted keyword searches, was imparted to the Examiner solely by the disclosure provided by Applicants, rather than from any objective evidence of record. How else could the Examiner have been led by the above-cited general coding statements from Saleh to multiple description coding in particular, or vice-versa?

The Examiner at page 13, last paragraph of the Answer attempts to address this apparent deficiency of the proposed combination of Fleming and Saleh, by stating that the failure of Saleh to make any mention of multiple description coding is irrelevant because "multiple description coding is taught by . . . the primary reference." This further illustrates the hindsight-based reasoning that has been applied. Since there is no mention whatsoever of multiple description coding in Saleh, which the Examiner appears to now acknowledge, there is simply no support for the particular combination alleged to be obvious. Applicants submit that the only teaching or suggestion anywhere in the record regarding combination of multiple description coding with frequency hopping is in the disclosure provided by Applicants, and the Examiner may not rely upon that disclosure to support an obviousness rejection.

For the reasons identified above and in the previously-filed Appeal Brief, Applicants respectfully submit that the §103(a) rejections are improper and should be withdrawn.

Respectfully submitted,



Joseph B. Ryan
Attorney for Applicant(s)
Reg. No. 37,922
Ryan, Mason & Lewis, LP
90 Forest Avenue
Locust Valley, NY 11560
(516) 759-7517

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